Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (Currently Amended) A method for performing path-level access control evaluation for a structured document ~~in a collection~~, wherein the structured document comprises a plurality of nodes and each of the <u>plurality of</u> nodes is described by a path, the method comprising the steps of:

   (a)   ~~providing a cache for temporarily~~ storing <u>an access control statement in</u> a cache entry for a path associated with a node of the plurality of nodes;

   (b)   receiving a query, wherein the query comprises a request to access the node;

   (c)   checking the cache entry for the path associated with the node; and

   (d)   ~~determining whether to~~ grant<u>ing or denying</u> access to the node based on <u>the access control statement in</u> the cache entry <u>for the path associated with the node.</u>

2.   (Currently Amended) The method of claim 1, wherein the ~~cache entry~~ <u>access control statement</u> is one of a grant <u>statement,</u> <u>a</u> deny <u>statement,</u> <u>an</u> unknown <u>statement,</u> and <u>a</u> data-dependent statement.

3.   (Currently Amended)   The method of claim 2, wherein ~~determining~~ step (d) further ~~comprising~~ <u>comprises</u>:

(d1)   granting access to the node ~~if the cache entry is~~ <u>responsive to the access control statement being</u> a grant statement.

4.   (Currently Amended)   The method of claim 2, wherein ~~determining~~ step (d) further ~~comprising~~ <u>comprises</u>:

(d1)   denying access to the node ~~if the cache entry is~~ <u>responsive to the access control statement being</u> a deny statement.

5.   (Currently Amended)   The method of claim 2, wherein ~~determining~~ step (d) further ~~comprising~~ <u>comprises</u>:

(d1)   evaluating an access control policy ~~for the structured document~~ affecting the path ~~if the cache entry is~~ <u>in response to the access control statement being</u> an unknown statement;

(d2)   granting access <u>if</u> <u>responsive to</u> a result of the evaluation ~~in step (d1) grants~~ <u>granting</u> access; and

(d3)   denying access <u>if</u> <u>responsive to</u> the result of the evaluation ~~in step (d1) denies~~ <u>denying</u> access.

6.   (Currently Amended) The method of claim 5, further comprising:

(e)   determining   whether   the   access   control   policy   affecting   the   path   is data-dependent;

(f)   changing the access control statement in the cache entry from the unknown statement to a grant statement or a deny statement based on the evaluation in step (d1) if in response to the access control policy affecting the path is not data-dependent being data-independent; and

(g)   changing the access control statement in the cache entry from the unknown statement to a data-dependent statement if in response to the access control policy affecting the path is being data-dependent.

7.   (Currently Amended)   The method of claim 2, wherein determining step (d) further comprising comprises:

(d1)   evaluating an access control policy for the structured document affecting the path if the cache entry is in response to the access control statement being a data-dependent statement;

(d2)   granting access if responsive to a result of the evaluation in step (d1) grants granting access; and

(d3)   denying access if responsive to the result of the evaluation in step (d1) denies denying access.

8,   (Currently Amended) The method of claim 1, further comprising:

(e)   repeating checking and determining steps (c) and (d) for a next node in the plurality of nodes.

9.　(Original)　The method of claim 5, wherein evaluating step (d1) further comprises:

(d1i)　evaluating a value expression for the path associated with the node, wherein the value expression is an executable statement based on the access control policy affecting the path and indicates who has access to the node.

10.　(Currently Amended)　The method of claim [[9]] 1, wherein ~~checking and determining~~ steps (c) and (d) are performed during ~~a run-time~~ run-time.

11.　(Currently Amended)　A computer readable medium containing ~~programming instructions~~ a computer program for performing path-level access control evaluation for a structured document ~~in a collection~~, wherein the structured document comprises a plurality of nodes and each of the plurality of nodes is described by a path, the computer program comprising programming instructions for:

(a)　~~providing a cache for temporarily~~ storing an access control statement in a cache entry for a path associated with a node of the plurality of nodes;

(b)　receiving a query, wherein the query comprises a request to access the node;

(c)　checking the cache entry for the path associated with the node; and

(d)　~~determining whether to~~ granting or denying access to the node based on the access control statement in the cache entry for the path associated with the node.

12.　(Currently Amended)　The computer readable medium of claim 11, wherein the ~~cache entry~~ access control statement is one of a grant statement, a deny statement, an unknown statement, and a data-dependent statement.

13.　(Currently Amended)　The computer readable medium of claim 12, wherein ~~determining~~ instruction (d) further ~~comprising~~ <u>comprises</u>:

(d1)　granting access to the node ~~if the cache entry is~~ <u>responsive to the access control</u> <u>statement being</u> a grant statement.

14.　(Currently Amended)　The computer readable medium of claim 12, wherein ~~determining~~ instruction (d) further ~~comprising~~ <u>comprises</u>:

(d1)　denying access to the node ~~if the cache entry is~~ <u>responsive to the access control</u> <u>statement being</u> a deny statement.

15.　(Currently Amended)　The computer readable medium of claim 12, wherein ~~determining~~ instruction (d) further ~~comprising~~ <u>comprises</u>:

(d1)　evaluating an access control policy ~~for the structured document~~ affecting the path ~~if the cache entry is~~ <u>in response to the access control statement being</u> an unknown statement;

(d2)　granting access ~~if~~ <u>responsive to</u> a result of the evaluation ~~in instruction (d1) grants~~ <u>granting</u> access; and

(d3)　denying access ~~if~~ <u>responsive to</u> the result of the evaluation ~~in instruction (d1)~~ ~~denies~~ <u>denying</u> access.

16.　(Currently Amended)　The computer readable medium of claim 15, ~~further comprising~~ <u>wherein the computer program further comprises programming instructions for</u>:

(e)　determining whether the access control policy affecting the path is data-dependent;

(f) changing the access control statement in the cache entry from the unknown statement to a grant statement or a deny statement based on the evaluation ~~in instruction (d1) if~~ in response to the access control policy ~~affecting the path is not data-dependent~~ being data-independent; and

(g) changing the access control statement in the cache entry from the unknown statement to a data-dependent statement ~~if~~ in response to the access control policy ~~affecting the path is~~ being data-dependent.

17. (Currently Amended) The computer readable medium of claim 12, wherein ~~determining~~ instruction (d) further ~~comprising~~ comprises:

(d1) evaluating an access control policy ~~for the structured document~~ affecting the path ~~if the cache entry is~~ in response to the access control statement being a data-dependent statement;

(d2) granting access ~~if~~ responsive to a result of the evaluation ~~in instruction (d1) grants~~ granting access; and

(d3) denying access ~~if~~ responsive to the result of the evaluation ~~in instruction (d1)~~ ~~denies~~ denying access.

18. (Currently Amended) The computer readable medium of claim 11, ~~further comprising~~ wherein the computer program further comprises programming instructions for:

(e) repeating ~~checking and determining~~ instructions (c) and (d) for a next node in the plurality of nodes.

19.   (Original) The computer readable medium of claim 15, wherein evaluating instruction (d1) further comprises:

(d1i)   evaluating a value expression for the path associated with the node, wherein the value expression is an executable statement based on the access control policy affecting the path and indicates who has access to the node.

20.   (Currently Amended) The computer readable medium of claim ~~19~~ 11, wherein ~~checking and determining~~ instructions (c) and (d) are performed during ~~a run-time~~ run-time.

21.   (Currently Amended) A method for performing path-level access control evaluation for a structured document ~~in a collection~~, wherein the structured document comprises a plurality of nodes and each of the plurality of nodes is described by a path, the method comprising the steps of:

(a)   ~~providing a cache for temporarily~~ storing an access control statement in a cache entry for a path associated with a node of the plurality of nodes, wherein the ~~cache entry~~ access control statement is one of a grant statement, a deny statement, an unknown statement, and a data-dependent statement;

(b)   receiving a query, wherein the query comprises a request to access the node;

(c)   checking the cache entry for the path associated with the node;

(d)   granting access to the node ~~if the cache entry is~~ responsive to the access control statement being a grant statement;

(e)   denying access to the node ~~if the cache entry is~~ responsive to the access control statement being a deny statement; and

(f)   ~~determining access control if the cache entry is~~ <u>evaluating a value expression for the path associated with the node to produce a result in response to the access control statement</u> <u>being</u> an unknown <u>statement</u> or <u>a</u> data-dependent statement<u>,</u>

<u>wherein the value expression is an executable statement based on an access control policy affecting the path and indicates who has access to the node.</u>

22.   (Currently Amended) The method of claim 21, ~~wherein the determining step (f)~~ further comprising:

~~(f1)   evaluating a value expression for the path associated with the node, wherein the value expression is an executable statement based on an access control policy affecting the path and indicates who has access to the node;~~

(~~f2~~ <u>g</u>)   granting or denying access to the node based on [[a]] <u>the</u> result of the evaluation ~~in step (f1)~~;

(~~f3~~ <u>h</u>) changing <u>the access control statement in</u> the cache entry <u>from the unknown statement</u> to a grant <u>statement</u> or <u>a</u> deny statement based on the result of the evaluation ~~in step (f1) if~~ <u>in response to</u> the access control policy ~~affecting the path is not data-dependent~~ <u>being data-independent</u>; and

(~~f4~~ <u>i</u>)   changing <u>the access control statement in</u> the cache entry <u>from the unknown statement</u> to a data-dependent statement ~~if~~ <u>in responsive to</u> the access control policy ~~affecting the path is~~ <u>being</u> data-dependent.

23.   (Currently Amended) The method of claim 22, further comprising:

(~~g~~ <u>j</u>)   repeating steps (c) through (~~f~~ <u>i</u>) for a next node <u>in the plurality of nodes</u>.

24.   (Currently Amended)   A computer readable medium containing ~~programming instructions~~ a computer program for performing path-level access control evaluation for a structured document ~~in a collection~~, wherein the structured document comprises a plurality of nodes and each of the plurality of nodes is described by a path, the computer program comprising programming instructions for:

(a)   ~~providing a cache for temporarily~~ storing an access control statement in a cache entry for a path associated with a node of the plurality of nodes, wherein the ~~cache entry~~ access control statement is one of a grant statement, a deny statement, an unknown statement, and a data-dependent statement;

(b)   receiving a query, wherein the query comprises a request to access the node;

(c)   checking the cache entry for the path associated with the node;

(d)   granting access to the node ~~if the cache entry is~~ responsive to the access control statement being a grant statement;

(e)   denying access to the node ~~if the cache entry is~~ responsive to the access control statement being a deny statement; and

(f)   ~~determining access control if the cache entry is~~ evaluating a value expression for the path associated with the node to produce a result in response to the access control statement being an unknown statement or a data-dependent statement,

wherein the value expression is an executable statement based on an access control policy affecting the path and indicates who has access to the node.

25.   (Currently Amended)   The computer readable medium of claim 24, wherein the ~~determining instruction (f) further comprising~~ computer program further comprises programming instructions for:

(f1)   ~~evaluating a value expression for the path associated with the node, wherein the value expression is an executable statement based on an access control policy affecting the path and indicates who has access to the node;~~

(~~f2~~ g)   granting or denying access to the node based on [[a]] the result of the evaluation ~~in step (f1)~~;

(~~f3~~ h)   changing the access control statement in the cache entry from the unknown statement to a grant statement or a deny statement based on the result of the evaluation ~~in instruction (f1) if~~ in response to the access control policy ~~affecting the path is not data-dependent~~ being data-independent; and

(~~f4~~ i)   changing the access control statement in the cache entry from the unknown statement to a data-dependent statement ~~if~~ in response to the access control policy ~~affecting the path is~~ being data-dependent.

26.   (Currently Amended)   The computer readable medium of claim 25, ~~further comprising~~ wherein the computer program further comprises programming instructions for:

(~~g~~ j)   repeating instructions (c) through (~~f~~ i) for a next node in the plurality of nodes.

27.   (Currently Amended) A system for performing path-level access control evaluation for a structured document ~~in a collection~~, wherein the structured document comprises a plurality of nodes and each of the <u>plurality of</u> nodes is described by a path, <u>the system</u> comprising:

a database management system ~~in a computer system for receiving~~ <u>operable to receive</u> a query, wherein the query comprises a request to access a node of the plurality of nodes; and

a cache ~~in the computer system~~ coupled to the database management system<u>,</u> ~~for temporarily storing~~ <u>the cache being operable to store an access control statement in</u> a cache entry for a path associated with the node,

wherein the database management system is ~~configured~~ <u>further operable</u> to check the cache entry for the path associated with the node and ~~to determine whether~~ to grant or deny access to the node based on <u>the access control statement in</u> the cache entry <u>for the path associated with the node</u>.

28.   (Currently Amended) The system of claim 27, wherein the ~~cache entry~~ <u>access control statement</u> is one of a grant <u>statement</u>, <u>a</u> deny <u>statement</u>, <u>an</u> unknown <u>statement</u>, and <u>a</u> data-dependent statement.

29.   (Currently Amended) The system of claim 28, further comprising:

an ~~Access Control~~ <u>access control</u> mechanism coupled to the database management system<u>,</u> ~~for determining~~ <u>the access control mechanism being operable to determine</u> access control to the node ~~if the cache entry is~~ <u>responsive to the access control statement being</u> an unknown <u>statement</u> or <u>a</u> data-dependent statement.

30.   (Currently Amended) The system of claim 29, wherein the ~~Access Control~~ access control

mechanism is ~~configured~~ further operable to generate a value expression for the path associated

with the node ~~a corresponding value expression~~ based on an access control policy ~~for the~~

~~structured document~~ affecting the path, and wherein the database management system ~~evaluates~~

is further operable to evaluate the ~~corresponding~~ value expression for the path to determine

whether to grant or deny access to the node.

31.   (Currently Amended) The system of claim 30, wherein the database management system

is ~~configured~~ further operable to change the access control statement in the cache entry from ~~an~~

the unknown statement to a grant statement or a deny statement based on a result of the

evaluation of the value expression ~~if~~ responsive to the value expression for the path ~~is not data-~~

~~dependent~~ being data-independent and to change the access control statement in the cache entry

from ~~an~~ the unknown statement to a data-dependent statement ~~if~~ responsive to the value

expression for the path ~~is~~ being data-dependent.